

# ZXTN19055DZ

## 55V, SOT89, NPN medium power transistor

### Summary

$BV_{CEX} > 150V$

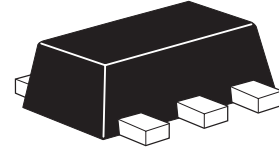
$BV_{CEO} > 55V$

$I_{C(cont)} = 6A$

$V_{CE(sat)} < 60mV @ 1A$

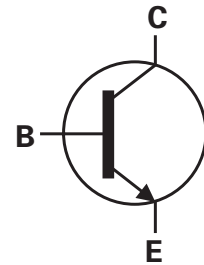
$R_{CE(sat)} = 28m\Omega$

$P_D = 2.1W$



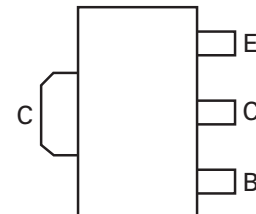
### Description

Packaged in the SOT89 outline this low saturation 55V NPN transistor offers extremely low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.



### Feature

- Extremely low equivalent on-resistance of 28mΩ
- 6 Amps continuous current
- Up to 10 amps peak current
- Very low saturation voltages
- Excellent  $h_{FE}$  characteristics up to 10 amps
- 150V Forward blocking voltage



Pinout - top view

### Applications

- Emergency lighting circuits
- Motor driving (including DC fans)
- Solenoid, relay and actuator drivers
- DC modules
- Backlight inverters

### Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN19055DZTA	7	12	1000

### Device marking

S75

# ZXTN19055DZ

## Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	$V_{CBO}$	150	V
Collector-emitter voltage (forward blocking voltage)	$V_{CEX}$	150	V
Collector-emitter voltage (base open)	$V_{CEO}$	55	V
Emitter-base voltage	$V_{EBO}$	7	V
Continuous collector current <sup>(b)</sup>	$I_C$	6	A
Peak pulse current	$I_{CM}$	10	A
Power dissipation at $T_{amb} = 25^{\circ}C^{(a)}$	$P_D$	1.5	W
Linear derating factor		12	mW/°C
Power dissipation at $T_{amb} = 25^{\circ}C^{(b)}$	$P_D$	2.1	W
Linear derating factor		16.8	mW/°C
Operating and storage temperature range	$T_j, T_{stg}$	-55 to +150	°C

## Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient <sup>(a)</sup>	$R_{\theta JA}$	83	°C/W
Junction to ambient <sup>(b)</sup>	$R_{\theta JA}$	59	°C/W

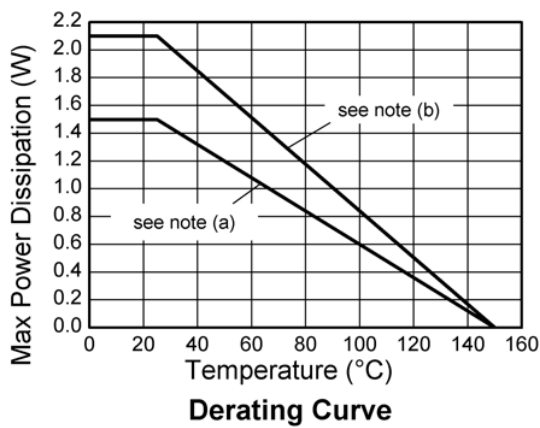
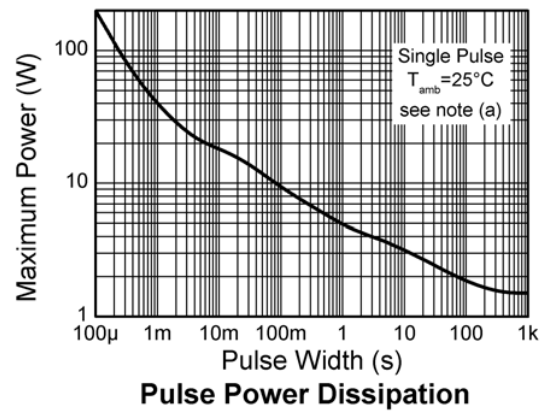
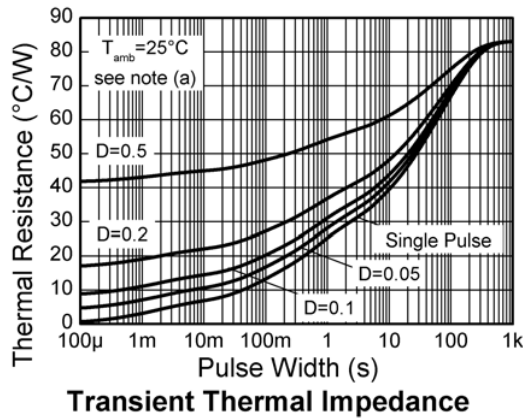
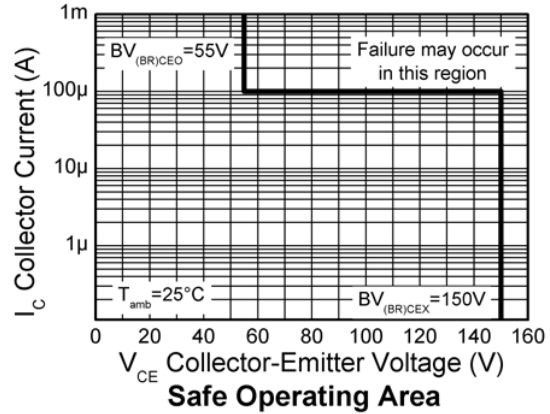
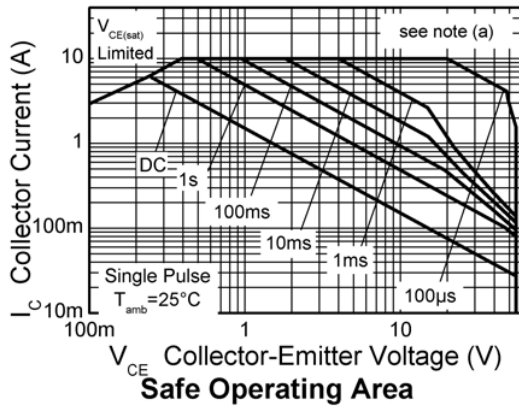
### NOTES:

(a) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(b) For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

# ZXTN19055DZ

## Characteristics



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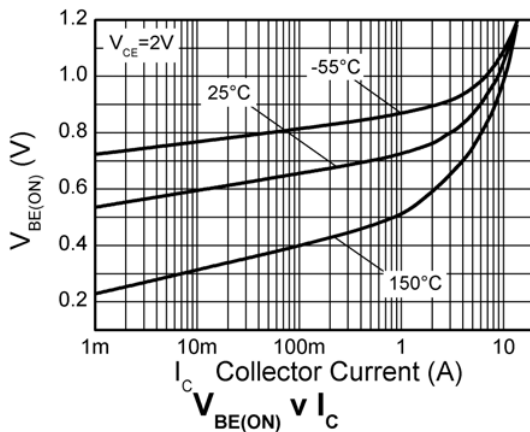
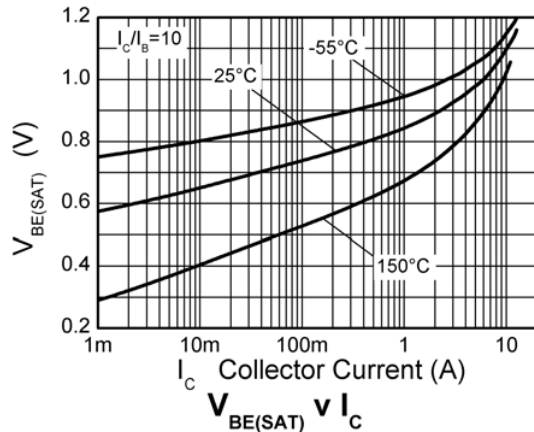
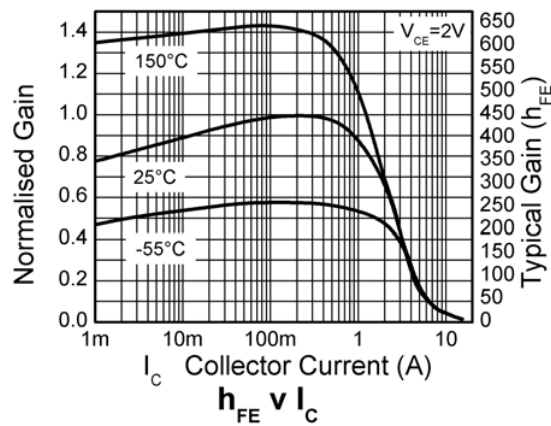
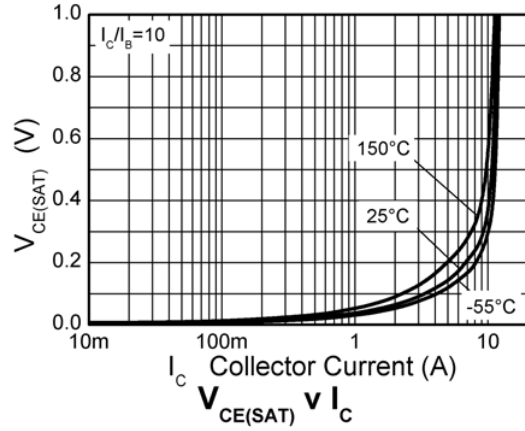
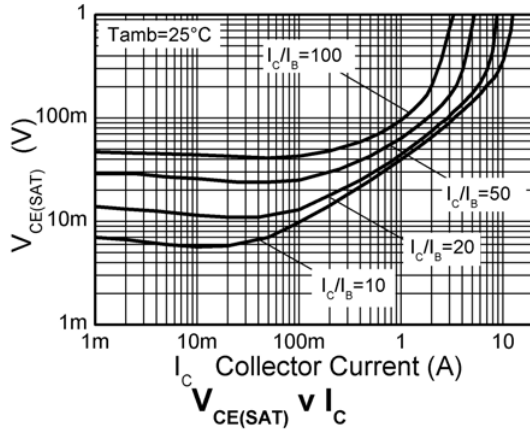
## Electrical characteristics (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	150	200		V	$I_C = 100\text{mA}$
Collector-emitter breakdown voltage (forward blocking)	$BV_{CEX}$	150	200		V	$I_C = 100\text{mA}$ , $R_{BE} < 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < +0.25\text{V}$
Collector-emitter breakdown voltage (base open)	$BV_{CEO}$	55	75		V	$I_C = 10\text{mA}^{(*)}$
Emitter-base breakdown voltage	$BV_{EBO}$	7	8.1		V	$I_E = 100\text{mA}$
Collector-base cut-off current	$I_{CBO}$		<1	50 20	nA $\mu\text{A}$	$V_{CB} = 120\text{V}$ $V_{CB} = 120\text{V}$ , $T_{amb} = 100^{\circ}\text{C}$
Collector-emitter cut-off current	$I_{CEX}$		<1	100	nA	$V_{CE} = 120\text{V}$ ; $R_{BE} < 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Emitter cut-off current	$I_{EBO}$		<1	50	nA	$V_{EB} = 5.6\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$		25 45 40 200 110 140 170	40 70 60 350 140 200 250	mV mV mV mV mV mV mV	$I_C = 0.5\text{A}$ , $I_B = 50\text{mA}^{(*)}$ $I_C = 1\text{A}$ , $I_B = 50\text{mA}^{(*)}$ $I_C = 1\text{A}$ , $I_B = 100\text{mA}^{(*)}$ $I_C = 2\text{A}$ , $I_B = 20\text{mA}^{(*)}$ $I_C = 2\text{A}$ , $I_B = 40\text{mA}^{(*)}$ $I_C = 4\text{A}$ , $I_B = 200\text{mA}^{(*)}$ $I_C = 6\text{A}$ , $I_B = 600\text{mA}^{(*)}$
Base-emitter saturation voltage	$V_{BE(sat)}$		800 1000	900 1150	mV mV	$I_C = 2\text{A}$ , $I_B = 20\text{mA}^{(*)}$ $I_C = 6\text{A}$ , $I_B = 600\text{mA}^{(*)}$
Base-emitter turn-on voltage	$V_{BE(on)}$		760 900	900 1050	mV mV	$I_C = 2\text{A}$ , $V_{CE} = 2\text{V}^{(*)}$ $I_C = 6\text{A}$ , $V_{CE} = 2\text{V}^{(*)}$
Static forward current transfer ratio	$h_{FE}$	250 250 180 30	400 400 300 50 20	700		$I_C = 10\text{mA}$ , $V_{CE} = 2\text{V}^{(*)}$ $I_C = 1\text{A}$ , $V_{CE} = 2\text{V}^{(*)}$ $I_C = 2\text{A}$ , $V_{CE} = 2\text{V}^{(*)}$ $I_C = 6\text{A}$ , $V_{CE} = 2\text{V}^{(*)}$ $I_C = 10\text{A}$ , $V_{CE} = 2\text{V}^{(*)}$
Transition frequency	$f_T$	140	200		MHz	$I_C = 100\text{mA}$ , $V_{CE} = 10\text{V}$ $f = 50\text{MHz}$
Output capacitance	$C_{OBO}$		21.2	30	pF	$V_{CB} = 10\text{V}$ , $f = 1\text{MHz}$
Delay time	$t_d$		13.8			$V_{CC} = 10\text{V}$ ,
Rise time	$t_r$		21.9			$I_C = 1\text{A}$ ,
Storage time	$t_s$		546			$I_{B1} = I_{B2} = 100\text{mA}$
Fall time	$t_f$		106			

### NOTES:

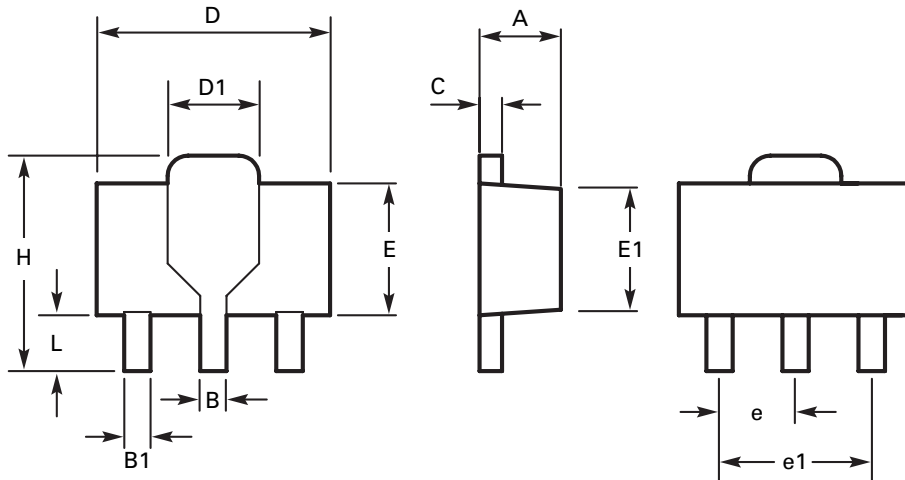
(\*) Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .

## Typical characteristics



# ZXTN19055DZ

## Package outline - SOT89



DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	1.40	1.60	0.550	0.630	E1	2.13	2.29	0.084	0.090
B	0.44	0.56	0.017	0.022	e	1.50 BSC		0.059 BSC	
B1	0.36	0.48	0.014	0.019	e1	3.00 BSC		0.118 BSC	
C	0.35	0.44	0.014	0.019	H	3.94	4.25	0.155	0.167
D	4.40	4.60	0.173	0.181	L	0.89	1.20	0.155	0.167
E	2.29	2.60	0.090	0.102		-	-	-	-

**Note:** Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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